



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

A constructively critical review of change and innovation related concepts

Citation for published version:

Potocnik, K & Anderson, N 2016, 'A constructively critical review of change and innovation related concepts: Toward conceptual and operational clarity' *European Journal of Work and Organizational Psychology*, vol. 25, no. 4, pp. 481-494. DOI: 10.1080/1359432X.2016.1176022

Digital Object Identifier (DOI):

[10.1080/1359432X.2016.1176022](https://doi.org/10.1080/1359432X.2016.1176022)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

European Journal of Work and Organizational Psychology

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Abstract

The aim of this paper is to examine and clarify the nomological network of change and innovation (CI) - related constructs. A literature review in this field revealed a number of inter-related constructs that have emerged over the last decades. We examine several such constructs - innovation, creativity, proactive behaviours, job crafting, voice, taking charge, personal initiative, submitting suggestions, and extra-role behaviours. Our conceptual analysis suggests each one of these constructs represents a specific component of CI-related behaviours. However, we also found that on occasion these concepts have been dysfunctionally operationalized with evidence of three dysfunctional effects: (i) construct confusion, (ii) construct drift, and (iii) construct contamination. Challenges for future research to enhance conceptual and operational clarity are discussed.

Keywords: creativity, innovation, proactivity, extra-role behaviour, conceptual clarity

A Constructively Critical Review of Change and Innovation Related Concepts: Toward Conceptual and Operational Clarity

“Constructs exist only in referential relationships, either explicit or implicit, with other constructs and with phenomena they are designed to represent. New constructs are rarely created de novo. Rather, they are usually the result of creative building upon pre-existing constructs, which themselves refer to other extant constructs, in an ongoing web of referential relationships” (Suddaby, 2010, p. 350).

Across the work and organizational psychology literature there has been an increasing number of concepts associated with how employees, teams, and organizations overall attempt to enact change and modify work roles, organizational processes, and outcomes at different levels of analysis (Anderson, Potočnik, & Zhou, 2014). For instance, the areas of creativity and innovation, proactive behaviours, and extra-role behaviours all aim to address and explain, in one way or another, how individuals, teams, and organizations introduce and implement changes to improve the organizational functioning. Given the importance of effective change management and innovation for the organizations to gain competitive advantage and secure their long-term success, it is not surprising that the research in this particular field has flourished during the recent years. In the present paper we coin the term ‘*Change and innovation (CI) literatures*’ to explore the nomological network of different concepts in this field. Perhaps more than any other area, the CI literatures comprises a number of distinct but related constructs and a proliferation of sub-constructs describing what could appear *prima facie* to be ostensibly similar phenomena in organizations. This has led to the rather complex construct space in the CI literatures and applied research, with several interdependent constructs all having distinct value but appearing to possess at least some similarities and notable overlaps. In their recent meta-analysis, for instance, Tornau and Frese

(2013) have attempted to clean-up a construct space related to the proactive behaviours in particular and observed some overlaps. In our paper, however, we go beyond the proactivity to include several different concepts all related with enacting change and innovation in the organizations.

Specifically, in the current paper, we examine nine specific constructs in these areas that have commanded increasing attention by researchers over recent years: (1) innovation, (2) creativity, (3) proactive behaviours, (4) job crafting, (5) voice, (6) taking charge, (7) personal initiative, (8) submitting suggestions, and (9) extra-role behaviours. The scarce empirical data exploring these concepts simultaneously in a single study unfortunately prevents us from conducting a meta-analysis on all these concepts. However, our approach of exploring the nomological network of CI-related constructs allows us to explore conceptual relationships between constructs that are unlikely to be empirically studied simultaneously in a single study (e.g., job crafting and innovation). Our conceptual analysis also allows us to bring into the discussion the important issue of levels of analysis which could not be meta-analytically addressed with the scarce current research.

The rationale for sampling these concepts was threefold. First, we wanted to focus on concepts that are concerned with behaviours that aim to bring about the change that benefit the organizations. Second, we wanted to include concepts that vary in terms of both breadth (i.e., from more narrow concepts, such as submitting suggestions to broader concepts such as proactive behaviours) and target (i.e., from constructs geared more towards the individual such as job crafting to constructs oriented towards wider organization, such as innovation). Third, whilst considering the first and the second criteria, we also aimed to analyze well-cited and relatively well-established constructs in the area of change and innovation to allow deeper conceptual analysis. With these criteria in mind, we did not include other discretionary behaviours, such as counterproductive work behaviours which are considered

by the organizations as against their legitimate interests (Sackett & DeVore, 2001). Also, in identifying these nine constructs, we were aware of other constructs that could have been included, such as very specific proactive behaviour-related concepts (e.g., issue selling, problem prevention, job change negotiation, revising tasks and expanding roles, etc.). However, in order to illustrate our point of a congested construct space, we limited our analysis to these nine rather major constructs. Other more specific proactivity constructs are also beyond the scope of our present conceptual critique and other authors have reviewed these constructs elsewhere (see, for instance, Grant & Ashford, 2008; Parker & Collins, 2010). Although our list of nine selected concepts is therefore not exhaustive, we believe it represents an essentially inclusive set of major CI-related concepts all concerned with introducing change in the organizations in order to improve their functioning.

Such a proliferation of CI-related concepts raises the vexed question of conceptual clarity. In other words to what extent these concepts can be distinguished from each other, to what extent they represent truly distinct phenomena in organizations, and to what degree advances in research in each of these sub-domains contribute either independently or synergistically to our understanding of CI phenomena in workplaces. In addition to this proliferation, there has been an exponential growth in the number of published research papers across the CI literatures. Figure 1 illustrates this increase from 1980 till the end of 2014.

 INSERT FIGURE 1 ABOUT HERE

Over this period our keyword search comprising these nine CI-related constructs in Social Science Citation Index (SSCI) within applied psychology and behavioural sciences areas generated a total of almost 10,000 publications, indicating unequivocally the sheer size of the CI literatures presently. However, more remarkable still is the exponential growth in

publications over the three decades covered by Figure 1: in the last 4 years alone some 3,458 papers have appeared, representing one third of the entire total over this 34-year period. This indicates that the CI literatures have expanded far more rapidly in recent years due to the combined efforts of researchers active in these areas. The sheer volume of papers now in publication in itself presents challenges for researchers, but so do potential conceptual and methodological similarities and overlaps evident across this huge literature base.

In addition to this growth in publications, several studies illustrate lack of clarity and disconnect between different CI-related constructs. Fay, Borill, Amir, Haward, and West (2006), for instance, in their study into team innovation in multidisciplinary health care teams infer their conclusions to extra-role behaviours in general. Moreover, some researchers have frequently assessed creativity with measures that include items of idea implementation or have used measures of creativity to assess innovation (e.g., Shin & Zhou, 2003; Zhang & Bartol, 2010; Zhou & George, 2001), although they and others explicitly differentiate between both constructs (e.g., Bledow, Frese, Anderson, Erez, & Farr, 2009a; West, 2002; Zhou & George, 2001). Other researchers have treated proactive behaviours as a type of extra-role behaviours (e.g., Chiaburu, Marinova, & Lim, 2007), although these are supposed to be distinguishable concepts (e.g., Grant & Ashford, 2008; Parker, Williams, & Turner, 2006). Are all these sub-constructs simply the manifestation of the huge growth in research and pragmatic interest into CI, given the pace of change experienced in many organizations over recent years? Or, has this area now reached a saturated construct space with many interrelated concepts failing to ensure sufficient conceptual clarity or integration? These questions and observations drive the main aim of this paper - to review, critique, and clarify the nomological network of CI-related constructs that has developed over recent years across the work and organizational psychology literature. In so doing, we aim to provide a comprehensive narrative review of definitions and clear terminology regarding CI-related

constructs, a contemporary critique of the state-of-the-science in this area, and lastly, a set of challenges and imperatives for future theory, empirical studies, and practical implications for the CI literatures. It is hoped that our conceptual integration will contribute to guiding future research in this area toward a clearer focus and definitional clarity, moving away from dysfunctional use of different CI-related constructs, and toward synergizing across these related constructs where areas of overlap are manifested either at a conceptual or operational level-of-analysis.

We begin by reviewing established definitions of each construct and by analyzing similarities and differences among them at the conceptual level. Next, we review the rather scarce empirical evidence attesting to their construct validity. Finally, we conclude with challenges for future research in the CI field and implications for practice.

Modelling the Construct Space: CI-Related Constructs Defined

There is a variety of constructs which, according to their definitions, refer to CI in some manner or other in the workplace. As outlined previously, we identified nine concepts that represent behaviours related to changing the current status of work roles, group processes, or organizations. We present their definitions along with example studies in Table 1. Most of these definitions explicitly highlight a discretionary behavioural component, however, we can also observe that some concepts are more specifically operationalized than others. Also, we note that these concepts differ in terms of how much novelty they involve and whether they represent in-role, extra-role or both types of behaviours. In summary, a wide variety of constructs have been suggested and studied in the CI field. The question that arises is what the boundaries, overlaps, and similarities between these constructs are. Next, we analyze each one of them in more detail. In Table 2 we summarize the main features of our conceptual analysis.

 INSERT TABLE 1 ABOUT HERE

 INSERT TABLE 2 ABOUT HERE

Innovation

Innovation in the workplace comprises the production of creative ideas as the first stage and the implementation of these ideas as the second stage (Anderson, Potočník, Bledow, Hulsheger, & Rosing, 2016; Hulsheger, Anderson, & Salgado, 2009; West & Farr, 1990). A more fine-grained approach to innovation has also separated idea promotion from the idea implementation as a separate, second stage in the innovation process in order to highlight the importance of securing support from the environment for successful idea implementation (Janssen, 2000; Kanter, 1988). Following West and Farr's (1990) definition (see Table 1), innovative behaviours are those that benefit the organizations at some level of analysis (see also Anderson, et al., 2014). Although innovation can be prescribed by the job as a role requirement and it is formally managed by the company, frequently individual employees engage in innovative behaviours based on their own initiative (West, 2002). Innovative behaviours can involve both in-role and extra-role elements: innovation might be part of the core tasks to be performed in one's job or alternatively, employees engage in innovative behaviours beyond their role prescriptions (West, 2002). We should also note that this widely accepted definition of innovation embraces terms such as role innovation as 'role' is included among different levels of adoption of novel ideas or procedures.

Creativity

Creativity has been considered as a subcategory of innovation (or the first part of the innovation process – the production/generation of novel and useful ideas). Some authors would use the term 'idea generation' (Nijstad, Diehl, & Stroebe, 2003), which in its essence

refers to creativity and can thus be considered as synonymous to creativity. However, some scholars argue for a stronger conceptual distinction between innovation and creativity (Potočník & Anderson, 2012; Rank, Pace, & Frese, 2004). For instance, innovation has been suggested as primarily an inter-individual social process, whereas creativity represents primarily an intra-individual cognitive process (Rank et al., 2004). That is, innovation can be distinguished from creativity based on its social nature whereby building alliances to get support for the implementation of creative ideas is essential (i.e., the idea promotion stage of creativity according to Janssen, 2000). Employees who are engaging in innovation are likely to be exposed to the evaluation of others in the organizations and subjected to public scrutiny all of which may influence their innovation efforts. In contrast, creativity as a very much individual process “stays” with the employee unless he or she decides to promote it in order to secure support for its implementation.

Another argument states that creativity refers to ideas that are absolutely novel, whereas innovation is present even where ideas are being adopted from previous experience or different organizations (so-called ‘relative novelty’ – see also West, 2002). Recently, however, the relative novelty has also been applied to creativity to study a so-called “incremental” creativity (Madjar, Greenberg, & Chen, 2011). Another argument for differentiation between these concepts relates to the levels-of-analysis at which either concept has referred to. Here, creativity has typically been used to refer exclusively to the individual level and increasingly also to the team level-of-analysis, whereas innovation has been applied to the individual-, team-, and organizational-levels-of-analysis (e.g., Oldham & Cummings, 1996). Generally, researchers use creativity to refer to the first part of the innovation process, that is, production of novel and useful ideas, which if implemented, may develop into innovation at one or more of these different levels-of-analysis.

Proactive Behaviours

The concept of proactive behaviours shares some important conceptual similarities with both innovation and creativity. Following the definition of proactivity (see Table 1), we could argue that improving current conditions or circumstances or creating new ones is a type of innovative behaviour since it implies ‘something’ new to the unit of adoption (see definition of innovation). Similar to innovation and creativity, proactive behaviours can also involve both in-role and extra-role elements (Crant, 2000; Grant & Ashford, 2008). However, the three concepts also have some important differences. As stated in the definition of proactivity by Parker and colleagues, who define proactive behaviour “as self-initiated, anticipatory action that aims to change and improve the situation or oneself” (Parker & Collins, 2010, p. 635; Parker et al., 2006), proactivity is inherently self-initiated or discretionary (Ohly & Fritz, 2010) whereas innovation and creativity could also be required by the job. Moreover, proactivity does not imply that the ideas of changing the status quo are necessary novel, whereas creativity and innovation are concerned with generation and implementation of, at least relatively, novel ideas to improve the current circumstances in the workplace. Finally, proactive behaviours have been suggested as individual-level concept, whereas creativity has been introduced as both individual and team level construct and innovation, in its essence, spans the individual, team and organizational levels of analysis.

Some scholars have argued that proactive behaviours with their future focus of identifying opportunities and anticipating problems might lead to innovation or creativity or they might lead to other outcomes (e.g., effective problem-solving strategies) (Grant & Ashford, 2008; Parker & Collins, 2010; Unsworth & Parker, 2003). Along these lines, past research has suggested innovation and creativity to be an outcome of proactivity (Binnewies, Ohly, & Sonnentag, 2007; Tornau & Frese, 2013).

Proactive behaviours can be further divided into more specific types of behaviours, such as proactive idea implementation, proactive problem solving, issue-selling and so forth

(Grant & Ashford, 2008; Parker & Collins, 2010). It is beyond the scope of the present paper to analyze each of these behaviours in detail. As noted previously, for the purpose of clarifying the nomological network of CI-related constructs, we have selected three specific types of proactive behaviours that have deserved increasing attention in the literature - job crafting, voice, and taking charge – which we discuss next.

Job Crafting

A definition in Table 1 reveals that job crafting, as a particular type of proactive behaviour that occurs in the context of prescribed jobs (Berg, Wrzesniewski, & Dutton, 2010b), shares similarities with individual role innovation (i.e., the introduction and implementation of novel ideas within a role). However, Wrzesniewski and Dutton (2001) in their seminal paper highlighted differences between both concepts. According to them, role innovation can only occur in certain type of work, whereas job crafting can occur in any type of job. Counter to this point, we would like to draw attention to the evidence showing innovation can also take place in any type of job, from shop floor (Axtell, Holman, & Wall, 2006) to top management (Nijstad, Berger-Selman, & De Dreu, 2014; West & Anderson, 1996). Another distinction between both concepts according to Wrzesniewski and Dutton (2001) is that role innovation is inherently a social action, whereas job crafting can be characterized as both, a social and an individual activity. Based on our own conceptual analysis of the CI-related constructs, we would add two important aspects that further differ job crafting from creativity and innovation: job crafting involves only self-initiated and in-role or task-related characteristics (Tims, Bakker, & Derks, 2012) whereas creativity and innovation can be both prescribed and self-initiated and can involve either in-role or extra-role elements.

Voice

Although voice has originally been introduced as a specific type of extra-role behaviour (Van Dyne & LePine, 1998; we discuss extra-role behaviours in more detail later on), the majority of more recent research has treated this construct as a type of proactive behaviour (Parker & Collins, 2010; Thomas, Whitman, & Viswesvaran, 2010; Thornau & Frese, 2013). Indeed, voice includes discretionary, self-initiated behaviours that involve both in-role and extra-role elements. As a concept referring to making innovative suggestions for change, voice appears to be closely related with creativity and innovation. Unsworth (2001), however, has noted that the operationalization and measurement of voice is different compared to creativity. Whereas creativity refers to generation of novel and useful ideas, the concept of voice refers to aspects such as keeping informed and speaking up along with introducing ideas and changes (e.g., “*This particular co-worker develops and makes recommendations concerning issues that affect this work group.*” and “*This particular co-worker speaks up in this group with ideas for new projects or changes in procedures*”, Van Dyne & LePine, 1998, p. 112). Although some measures of individual innovation and voice also overlap to some extent (e.g., the scale of Scott and Bruce (1994) which includes the item about communicating one’s own ideas with others), voice does not involve implementation of ideas and hence, it should be differentiated from innovation. A conceptual comparison between these constructs suggests that voice is closely related to idea promotion which according to Janssen (2000) represents the second stage in the innovation process. We may conclude that voice, creativity and innovation, respectively, are different, but related constructs insofar as they are all discretionary and can involve both in-role and extra-role behaviours that are aimed at improving the current conditions in the workplace or organizations. However, innovation and creativity can also be required by the job and involve at least relative novelty whereas voice does not (Parker & Collins, 2010).

Taking Charge

Another proactivity concept that has received a substantial attention in the proactivity literature is taking charge. Similarly as voice, also this concept has originally been introduced as a type of extra-role behaviour (Morrison & Phelps, 1999), although more recent literature has suggested this concept to be a specific type of proactive behaviour (Grant & Ashford, 2008; Parker & Collins, 2010; Thomas et al., 2010; Thornau & Frese, 2013). Based on its definition, taking charge can also involve in-role elements, such as discretionary efforts to introduce changes to how the work is executed within their jobs (similarly as job crafting). One could argue that taking charge is closely related with the second stage of innovation – that is idea implementation. Taking charge and innovation differ, however, based on the extent to which these two concepts are discretionary and of required novelty: whereas taking charge is self-initiated and does not require novelty, innovative behaviours are characterized at least in terms of relative novelty and can be either discretionary or required by the job.

Personal Initiative

Also personal initiative has been considered as a specific form of proactive behaviour (Ohly, Sonnentag, & Pluntke, 2006; Parker et al., 2006) and in fact, previous studies have operationalized proactive behaviours in terms of personal initiative (e.g., Ohly & Fritz, 2010). Nevertheless, Unsworth and Parker (2003) emphasized that personal initiative is conceptualized more stringently than proactivity because the behaviour must be consistent with the organizational goals and mission, have a long-term focus and persistence and be goal-directed (Frese, Kring, Soose, & Zempel, 1996). In terms of its relationship with creativity and innovation, past research has suggested that personal initiative is a part of both the idea generation (i.e., creativity) and the idea implementation (Frese & Fay, 2001; Binnewies et al., 2007).

Submitting Suggestions

Submitting ideas or suggestions either formally or informally has been considered as a form of employee personal initiative, because it involves extra effort (Frese, Teng, & Wijnen, 1999; Ohly et al., 2006). Ohly et al. (2006) in their recent study considered submitting ideas as both a creative and proactive behaviour. However, given that submitting suggestions represents a more formal suggestion system of the organizations whereby employees propose their own ideas to others (Parker et al., 2006), this type of behaviour differs from personal initiative and proactive behaviours which also involve self-implementation of ideas. Similarly, submitting suggestions differs from voice which also involves speaking up about ideas and encouraging others to be proactive. Finally, it also differs from creativity because employees may not only submit novel ideas but just any idea or suggestion they may have to improve the current work practices.

Extra-Role Behaviours

The concept of extra-role behaviours has been suggested to differentiate a set of behaviours that go beyond the formal work role descriptions that represent the basis for task performance. Although it has initially been suggested that extra-role behaviours are not rewarded by the organizations (Van Dyne & LePine, 1998), many organizations nowadays have started acknowledging the important role of this type of behaviours for the improvement of their organizational functioning by adding them into their appraisal and promotion criteria. Extra-role behaviours have been classified into four different categories: affiliative – promotive, also called organizational citizenship behaviours – OCBs, such as helping (Van Dyne, Cummings, & Parks, 1995), challenging – promotive, for instance voice (as argued previously, we consider this behaviour as type of proactivity), challenging-prohibitive (e.g., whistleblowing), and affiliative - prohibitive (e.g., stewardship). With regard to their relationship with other CI-related constructs, several differences can be identified. First, whereas extra-role behaviours refer to tasks that go beyond the work role expectations, all

concepts discussed thus far can take place in both, required (in-role) and non-required (extra-role) work tasks (Frese & Fay, 2001; Ng, Feldman, & Lam, 2010; Parker et al., 2006).

Another difference compared to innovation and creativity is that extra-role behaviours are inherently discretionary behaviours. Third, also behaviours that are not strictly change-oriented fall in the category of extra-role behaviours, such as helping or stewardship (Van Dyne et al., 1995). In summary, we would like to highlight that compared to innovation, creativity, proactive behaviours in general, job crafting, voice, taking charge, personal initiative and submitting suggestions, extra-role behaviours include only self-initiated behaviours which go beyond the role expectations.

Summary

In our analysis we identify innovation, creativity, proactive behaviours, and change-oriented extra-role behaviours as foundational constructs that guided the development of more specific constructs in the CI field. Table 2 shows that with the exception of change-oriented extra-role behaviours, all reviewed constructs involve in-role elements. In addition, we suggest that only job crafting does not include extra-role behaviours. Another interesting feature of our analysis is that all reviewed constructs are discretionary, whereas only innovation, creativity, and submitting suggestions could also be formally required by the job. These three constructs are also characterized by, at least, relative outcome novelty – though in the case of submitting suggestions not all ideas are necessarily novel as discussed previously. Finally, the reviewed constructs also vary in terms of target focus. Based on their definitions (see Table 1), we might conclude that proactive behaviours are mainly focused on individuals, whereas creativity's focus is both on teams and individuals. Innovation seems to be the only construct that, in its essence, can be operationalized at individual, team and organizational levels. In agreement with Sears and Baba (2011) and previous research suggesting proactive behaviours as antecedents of creativity and innovation (Binnewies et al.,

2007; Tornau & Frese, 2013), we could suggest that CI-related constructs build up the multistage, multilevel phenomena whereby the CI-related constructs evolve from individual proactive behaviours to individual and team creativity which in turn translates into innovation and organizational change. In other words, we may suggest that individual level CI-related behaviours may be aggregated first to higher level of team creativity and innovation which ultimately can be aggregated to innovation at the organizational level. Ultimately, we suggest that the field of change and innovation covers all these aspects of individual, team and organizational endeavors to bring about change for improvement within the organizations. Importantly, several structural and social factors may stimulate or inhibit behaviours at these different levels and stages (Kanter, 1988; Sears & Baba, 2011), such as motivation to innovate, resources in the task domain and innovation management skills. We discuss the issue of levels-of-analysis in more detail later in this paper (see challenges for future research).

Empirical Evidence for Differentiation between CI-Related Constructs

Although the research in CI has flourished in recent years (see Figure 1), only a few studies have examined the consensual and divergent validity of different CI-related constructs. For instance, Ohly et al. (2006) examined four different innovation-related outcomes: creativity, innovation, personal initiative, and submitting ideas to a formal suggestion system. They observed high correlations between creativity, innovation and personal initiative. The results of confirmatory factor analysis, however, supported the conceptual distinctiveness and construct validity of each concept. The correlations between submitting ideas and creativity, innovation, and personal initiative, respectively, were low (only the correlation with creativity reached the acceptable significance level). In another study, Ohly and Fritz (2010) provided additional support for the construct validity of

creativity and proactive behaviour (operationalized in terms of personal initiative). Their confirmatory factor analysis also showed that both concepts represented distinct constructs. Similarly, Tims et al. (2012) have provided evidence for conceptual difference between job crafting and personal initiative and proactivity, respectively. Furthermore, Parker and Collins (2010) explored multiple proactive behaviours, including voice, taking charge and individual innovation (individual innovation was considered as a type of proactive behaviour). Their results indicated some overlap, for instance one item of taking charge loaded higher on individual innovation and some items exhibited relatively low loadings on their respective factors. Overall, their results implied that different CI-related behaviours are distinguishable concepts, but they have a common root. More recently, however, Tornau and Frese (2013) observed strong meta-analytical correlations between voice, taking charge and personal initiative suggesting that to some extent these three constructs are functionally equivalent.

Other researchers have taken a rather different approach by, for instance, generating and subsequently validating their own measures combining aspects of different CI-related constructs. In their recent study, Ng et al. (2010) merged together items referring to idea generation, spread of innovation, and idea implementation to assess innovation-related behaviours (IRBs). The exploratory factor analysis supported one general IRB factor. Yet others had not explored discriminant validity of CI-related concepts, although they took into consideration more than one concept within the same study. For example, Miron, Erez, and Naveh (2004) examined both creativity and personal initiative but as personal characteristics to predict innovation which was assessed by the managers. They did not examine discriminant validity per se, although they found a correlation of .62 between creativity and personal initiative. The correlations between creativity and innovation and initiative and innovation were .22 and .23, respectively.

Although these attempts to attest the construct validity of different CI-related concepts are valuable, we suggest that much more work is needed in order to draw meaningful empirical conclusions about potential differences and/ or overlaps between these concepts. It is surprising how, beyond these lines of evidence for construct validity, little attention has been devoted to this important question by researchers active in this field. Given this shortcoming we next move on to discuss different barriers to construct clarity and the apparent manifestation of three barriers in particular which we term ‘construct confusion’, ‘construct drift’, and ‘construct contamination’, respectively.

Barriers to Construct Clarity

So far in this paper we have alluded to a number of ways in which distinct but interrelated constructs in the CI literatures have been used rather loosely to refer to what on the surface appear to be similar phenomena. Indeed, as we suggested earlier in this paper there is evidence that this lack of definitional clarity and operational vagueness has led to a rather puzzling picture across these literatures. Some studies are using one term while others are conceptualizing the same term in differing ways. Still others are using different terms to refer to what appears to be very similar or only marginally different phenomena (West & Farr, 1990). Although the extent of ambiguous use and operationalization of CI-related concepts does not appear to be a widespread problem with all CI-related concepts, the lack of clarity, vagueness of terminology, a rather frequent use of terms interchangeably, and lack of specificity of conceptual and operational formulations could have contributed to the conflated state-of-the-science presently evident. However, counter to this dysfunctionality it is also the case that all of these constructs do refer to different phenomena – or at least different aspects of the same broader picture of organizational change and innovation – that may well require more than a simplistic, uniconstructual nomological net of concepts to comprehensively

define and capture the various sub-elements comprising the CI field (see also Parker et al., 2006; Unsworth, 2001; Unsworth & Parker, 2003). We identify three dysfunctions in the literature - (a) construct confusion, (b) construct drift, and, (c) construct contamination. Although these dysfunctions may not have yet significantly damaged the nomological network of CI-related constructs, it is important to pay attention to them in order to suggest how this nomological network can be clarified and to highlight the need to avoid future dysfunctional uses of CI-related concepts.

Construct Confusion

This has occurred where studies have failed to clearly define their terms or have operationalized them in differing ways; it is perhaps the most common of the three dysfunctions we propose. Construct confusion occurs where studies have used different terms fully interchangeably (e.g., creativity and innovation, proactive behaviours and extra-role behaviours) and/or have failed to operationalize their key dependent variable(s) with sufficient clarity (Chiaburu et al., 2007; Van Dyne et al., 1995). As already mentioned previously, some studies have assessed creativity with items of idea implementation (e.g., Shin & Zhou, 2003; Zhang & Bartol, 2010; Zhou & George, 2001). Moreover, as West, Hirst, Richter, and Shipton (2004) pointed out, some studies have tended to use a combination of idea generation and idea implementation which could have led to confusing results over which predictors generate creativity and innovation.

Construct Drift

This dysfunction occurs where a number of studies over the years have incrementally moved the construct space under investigation (see also Suddaby, 2010). One way in which this happens is by new researchers to the field defining and operationalizing an existing construct slightly differently, and so over time, the precise phenomena in organizational change drifts to mean something quite different. Another cause is that the layer-on-layer

effect of construct confusion is to make successive studies increasingly lax in their construct formulation so that original definitions of a term become superseded by latter understandings in the research community (that is, the Zeitgeist shifts). These are both examples of what we term ‘unintentional drift’. There are, of course, examples of where researchers use ‘intentional drift’ to re-conceptualize, re-focus, or re-orient an older definition toward phenomena in innovation and change that have emerged more recently. Our contention is that the innovation and change literatures exhibit both unintentional and intentional drift, and that only the latter being supported by clear theoretical reformulations is likely to benefit understanding over time.

For instance, Bjørkelo, Einersen, and Matthiesen (2010) in their study on whistleblowing have referred to the term “prohibitive voice” although voice has been suggested and operationalized as promotive type of behaviour. Another example for construct drift comes from Vigoda-Gadot (2007) who recently coined the term ‘compulsory organizational citizenship behaviours (OCBs)’ to refer to situations in which employees feel obliged to engage in extra-role behaviours, even though these have inherently been considered as discretionary behaviours. The argument for this apparently self-contradictory construct in this field rests on grounds that employees often experience strong social or managerial pressure that makes them feel obliged to engage in informal, extra-role behaviours. Could we really talk about compulsory OCBs in this case or are we dealing with in-role behaviours that are enforced by the managers?

Construct Contamination

The final dysfunction of construct contamination has occurred where researchers have borrowed elements of other terms and definitions to both inform and supplement their own formulation of a particular construct. For instance, where studies into change-oriented extra-role behaviours have extended their criterion space to include elements of innovation, voice

or taking charge as part of their dependent variable (Choi, 2007) or studies into creativity that incorporated innovation and task performance into their criterion (Chen, 2006). Here, construct contamination differs from construct confusion in that researchers have openly been influenced by other constructs, often referred to them in the literature review preceding their study, and have consciously incorporated aspects of other related constructs.

Most likely, there is overlap between all three types of dysfunction and it can be difficult to precisely categorize any shift that has, over time, led to a lack of clarity in conceptual or operational formulation. It can also be argued that all three ‘dysfunctions’, as we term them, are ways in which scientific enquiry in the field of work and organizational psychology will naturally advance, develop, and extend its coverage as it progresses (e.g., Suddaby, 2010). Yet, we have to consider that the CI literatures have been affected by these dysfunctions - and at times not in a positive way.

Challenges for Future Research

Our conceptual analysis of CI-related constructs leads to a number of challenges for future research. Our aim is to stimulate research in this area towards a clearer focus, avoiding the above dysfunctions and contributing findings that could enrich theoretical developments in the field as well as practical implications. We propose three such major challenges.

The first challenge we would like to put forward is the need to clarify constructs and to operationalize constructs transparently and use appropriate terminology. Our analysis of the CI literatures suggests that too often different constructs have been used interchangeably or that one construct has been used to study the processes that are inherent to another construct. Future research should address this overriding challenge of construct clarity. One way of achieving this is to explicitly define the construct under consideration, highlighting its most significant characteristics. In this way, researchers set the conceptual grounds for their

study, indicating what phenomena they will be dealing with. Another way of contributing to the conceptual clarity in this field is empirically examining the issue of construct validity of CI-related constructs. As it was shown previously, only a handful of studies have examined the construct validity of different CI-related constructs. In order to draw more firmly-rooted conclusions regarding conceptual clarity showing that respondents can differentiate between CI-related constructs in such a rich conceptual space, more studies are needed to evaluate and quantify conceptual relations between these constructs from the perspective of respondents to organizational surveys.

Related to this, we would like to highlight the need to use appropriate, specific, and justifiable terminology and avoid the inappropriate use of interchangeable terms. Once constructs have been clearly defined, researchers are urged to use appropriate, adequate, and consistent terminology. That is, if the study is concerned with the production of novel and useful ideas, then authors should refer to creativity and not innovation. Referring to constructs in their appropriate terms and the avoidance of inappropriate use of different terms interchangeably are important to avoid confusion and to provide the research community with a common terminology. Indeed, recently Suddaby (2010) has noted that a common language is a necessary but not sufficient pre-condition for researchers interested in the same or similar phenomena to even have the potential to build knowledge and to exchange ideas satisfactorily. Along these lines, theoretical advancement in the field strongly depends on the ability to produce new knowledge based on the prior research. Such accumulation of knowledge, however, can only occur if scholars speak a ‘common’ language, as Suddaby (2010) persuasively argues.

The second challenge to be considered in the future research is to use appropriate measures of both independent and dependent variables. That is, CI researchers should not only define and label their research concepts with established terminology, but they should

also use appropriate measures to operationalize their constructs under investigation.

Measuring constructs with appropriate and adequate measures is essential for both the theoretical and practical implications of the research findings. If we study creativity in the workplace, but we measure it with an innovation scale, then our findings will have implications for innovation and not for creativity. Thus, the lack of measuring the constructs with the adequate measures could lead to misleading theoretical advancements related to the particular construct under consideration as well as to inappropriate practical implications.

Finally, as our third challenge we would like to stress the importance of specifying level(s)-of-analysis and to follow best scientific practice in the treatment of multilevel data. As noted previously, the definition of the innovation suggests that the introduction of novel ideas can be done at different units, such as work-role, team or organization. In this regard the innovation literature has become increasingly clear in arguing for different but potentially overlapping levels-of-analysis at the individual, team or organizational levels and in suggesting the need for more cross-level studies (Anderson et al., 2014; Anderson, De Dreu, & Nijstad, 2004; Sears & Baba, 2011). An examination of constructs at different levels of analysis is important to advance the knowledge and understanding of how “*individual, group, and organizational characteristics interact and combine to shape individual, group and organizational outcomes*” (Klein & Kozlowski, 2000, p. xvi). Hence, the advancement of research at the multiple levels of analysis in the field of CI that has been made so far is encouraging. However, as Klein and Kozlowski argue, researchers need to be consistent in at least three important aspects of their approach toward multilevel measurement: (1) consistency between theory and measurement, (2) consistency between measurement and statistical analysis, and (3) consistency between level of analysis and implications of the study.

Regarding the first type of inconsistency, researchers would sometimes conceptually argue about certain construct at the higher level of analysis, whereas they would measure it at the lower level of analysis. For instance, Bates and Khasawneh (2005) have examined the role of learning organizational culture and learning transfer climate in organizational innovation. Whereas they treated the variables at the organizational level conceptually, they measured them at the individual level. With respect to the inconsistency between measurement and statistical analyses, some researchers would measure CI-related constructs at higher levels, but then they would not deal with the data adequately in the statistical analysis. Gilson and Shalley (2004) examined a set of team variables and their role in team's engagement in creative processes. While they conceptually treated the variables at the team level and also measured them at the team level (based on the referent-shift model), they did not aggregate individual responses to the team level, hence they did not check for within-team agreement. A similar concern is observed in Elenkov and Manev (2005) who explored the moderating role of societal culture in the relationship between leadership and organizational innovation. The authors have measured the variables at the organizational and societal level, but they have analyzed their data by means of hierarchical regression analysis ignoring the nested structure of their data. Regarding the inconsistency between level of analysis and implications of the study, often researchers would draw conclusions from their studies carried out at one level of analysis to other levels, most frequently at higher levels (e.g., a study carried out at the individual level would end up having implications at more macro levels, such as organizational or even societal).

We concur fully with this need for these different types of consistency in order to contribute straightforward findings in the CI field. The typology put forward by Klein and Kozlowski (2000) provides CI researchers with a useful point of departure from which to consider the need for consistency in the treatment of levels-of-analysis issues.

In addition to these, rather broad challenges for future research, we also provide a list of more specific research questions in Table 3. We believe it is important to address these questions referring to different CI-related concepts simultaneously in order to gain empirical findings about their construct validity, to understand what antecedent variables different CI-related behaviours have in common and what differential outcomes they may lead to, among other topics.

Please Insert Table 3 about here

Implications for Practice

Given the importance of change and innovation for enhancing organizational effectiveness and overall performance, we identify a number of key implications for practice. These comprise in overview the issues of ‘translating’ research findings into practice-based recommendations, products to enhance creativity and innovation in the workplace, and the recognising the inherent complexities in change and innovation management in organizations.

First, using the appropriate and precise terminology is also important for communicating our research findings to practitioners. It is important that published research clearly states how its findings can be applied in practice and importantly, which CI-related construct they address (e.g., either innovation, or only creativity). This may sound to be axiomatic, but in fact there continues to be a flow of ‘how to’ best practice management books that seem to offer easy-to-implement solutions for practicing managers whose recommendations are unfounded upon any substantive research findings (for a critique see Anderson et al., 2016). Few appear to be research-based, rather many seem based upon the personal experience and opinions of the author(s), yet even a cursory scan of the bookshelves in airport and high street book stores reveals a large number of such popular-oriented books.

It appears that much of the CI research in the constructs we identified in this review has had only limited impact upon these practitioner-oriented texts, and that researchers have some way to go to bridge the divide between robust research findings and readily available advice for practicing managers.

Second, and linked to this point, it is clearly vital that consultancy products aimed at facilitating change management, enhancing innovation, empowering proactivity, or whatever, are evidence-based in their development and operation. Again, this has not been the case across the CI field. Unlike other areas of work and organizational psychology where validation has become a prerequisite in order to comply with professional practice or even legal standards, the field of consultancy tools in CI has not been driven by these imperatives and restrictions.

Third, and finally, our critical review suggests that the CI area is a complex conglomeration of different but related constructs, that change management is therefore necessarily going to be a complex and multifaceted undertaking, and that practicing managers should treat popular texts that purport to offer quick and easy solutions with real caution and a healthy degree of scepticism. One approach that shows considerable promise, in our view, is the concept of ‘ambidextrous management’ of innovation and change management initiatives (Bledow et al., 2009a; 2009b). Here, the ability of a manager to be capable of handling the day-to-day routine tasks on one hand, and facilitating creativity and innovation attempts simultaneously on the other, is emphasized. This approach, we believe, also has latent potential for the effective management of other change scenarios in organizations.

To summarize, in our view, these three themes of implications for practice arise from our review as the most pressing points to improve the transfer of research findings into organizational CI practices.

Conclusion

The aim of this paper was to clarify the nomological network of CI-related constructs at both a conceptual and operational level. Our analysis suggests that although there are a number of related constructs, all of which have gained increasing research attention, it is too simplistic to argue that there are “too many” constructs with essentially the same meaning. Rather, it is apparent that different concepts are used to represent specific components of CI-related behaviours and that there are distinct elements to each. However, we urge the researchers to clearly and properly define their concepts and use the appropriate terminology. Appropriate measures also need to be utilized in order to avoid any misspecification of the precise phenomena under investigation. Finally, more attention needs to be paid to levels of analysis, specifically, it is important to ensure that the conceptual level, the measurement level, and the level of data analysis are entirely congruent. We would like to suggest that these challenges to the CI literatures are core and not peripheral, and for our research in this diverse area to make a contribution to understanding of change and innovation events in organizations it is beholden upon researchers to consider these challenges and to respond to them to rectify some of the shortcomings evident across the rapidly expanding CI literatures. We hope that this paper is a first step along the pathway toward conceptual clarification of the complex nomological network of constructs that now form the CI literatures.

References

- Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior*, 10, 123-176.
- Anderson, N. R., de Dreu, C. K. W., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. *Journal of Organizational Behavior*, 25, 147-173.
- Anderson, N. R., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review and Prospective Commentary. *Journal of Management*, 40, 1297-1333.
- Anderson, N. R., Potočnik, K., Bledow, R., Hulsheger, U. R., & Rosing, K. (2016). Innovation and Creativity in Organizations. In D. Ones, N. Anderson, C. Viswesvaran, & H. K. Sinangil, (Eds), *Handbook of Industrial, Work and Organizational Psychology*, Second Edition. London and New York: Sage.
- Axtell, C., Holman, D., & Wall, T. (2006). Promoting innovation: A change study. *Journal of Occupational and Organizational Psychology*, 79, 509-516.
- Bates, R., & Khasawneh, S. (2005). Organizational learning culture, learning transfer climate and perceived innovation in Jordanian organizations. *International Journal of Training and Development*, 9, 96-109.
- Berg, J. M., Grant, A. M., & Johnson, V. (2010a). When callings are calling: Crafting work and leisure in pursuit of unanswered occupational callings. *Organization Science*, 21, 973-994.
- Berg, J. M., Wrzesniewski, A., & Dutton, J. E. (2010b). Perceiving and responding to challenges in job crafting at different ranks: When proactivity requires adaptivity. *Journal of Organizational Behavior*, 31, 158-186.

- Binnewies, C., Ohly, S., & Sonnentag, S. (2007). Taking personal initiative and communicating about ideas: What is important for the creative process and for idea creativity? *European Journal of Work and Organizational Psychology, 16*, 432-455.
- Bjørkelo, B., Einersen, S., & Matthiesen, S. B. (2010). Predicting proactive behavior at work: Exploring the role of personality as an antecedent of whistleblowing behavior. *Journal of Occupational and Organizational Psychology, 83*, 371-394.
- Bledow, R., & Frese, M. (2009). A situational judgment test of personal initiative and its relationship to performance. *Personnel Psychology, 62*, 229-258.
- Bledow, R., Frese, M., Anderson, N. R., Erez, M., & Farr, J. (2009a). A dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 2*, 305-337.
- Bledow, R., Frese, M., Anderson N. R., Erez, M., & Farr, J. L. (2009b). Rejoinder: Innovation is Quintessentially Multi-channel and Multi-process. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 3*, 363-373.
- Chen, M. (2006). Understanding the benefits and detriments of conflict on team creativity process. *Creativity & Innovation Management, 15*, 105-116.
- Chi, N., Huang, Y., & Lin, S. (2009). A double-edged sword? Exploring the curvilinear relationship between organizational tenure diversity and team innovation: The moderating role of team-oriented HR practices. *Group & Organization Management, 34*, 698-726.
- Chiaburu, D. S., & Baker, V. L. (2006). Extra-role behaviors challenging the status-quo: Validity and antecedents of taking charge behaviors. *Journal of Managerial Psychology, 21*, 620-637.
- Chiaburu, D. S., Marinova, S. V., & Lim, A. S. (2007). Helping and proactive extra-role behaviors: The influence of motives, goal orientation, and social context. *Personality and Individual Differences, 43*, 2282-2293.

- Choi, J. N. (2007). Change-oriented organizational citizenship behavior: Effects of work environment characteristics and intervening psychological processes. *Journal of Organizational Behavior*, 28, 467-484.
- Crant, J. M. (2000). Proactive behavior in organizations. *Journal of Management*, 26, 435-462.
- Ekvall, G. (1971). *Creativity at the place of work: A study of suggestors and suggestion systems in the Swedish mechanical industry*. Stockholm: The Swedish council for personnel administration.
- Elenkov, D. S., & Manev, I. M. (2005). Top management leadership and influence on innovation: The role of sociocultural context. *Journal of Management*, 31, 381-402.
- Fay, D., Borrill, C., Amir, Z., Haward, R., & West, M. A. (2006). Getting the most out of multidisciplinary teams: A multi-sample study of team innovation in health care. *Journal of Occupational & Organizational Psychology*, 79, 553-567.
- Frese, M., & Fay, D. (2001). Personal initiative: An active performance concept for work in the 21st century. *Research in Organizational Behavior*, 23, 133.
- Frese, M., Teng, E., & Wijnen, C. J. D. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior*, 20, 1139-1155.
- Frese, M., Kring, W., Soose, A., & Zempel, J. (1996). Personal initiative at work: Differences between East and West Germany. *Academy of Management Journal*, 39, 37-63.
- Gilson, L. L., & Shalley, C. E. (2004). A little creativity goes a long way: An examination of teams' engagement in creative processes. *Journal of Management*, 30, 453-470.
- Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, 28, 3-34.

- Hülshager, U. R., Anderson, N. R., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*, 1128-1145.
- Janssen, O. (2000). Job demands, perceptions of effort–reward fairness, and innovative work behavior. *Journal of Occupational and Organizational Psychology, 73*, 287–302.
- Janssen, O., & Giebels, E. (2013). When and why creativity-related conflict with coworkers can hamper creative employees' individual job performance. *European Journal of Work and Organizational Psychology, 22*, 574-587.
- Kanter, R. M. (1988). When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior, vol. 10* (pp. 169-211). Greenwich, CT: JAI Press.
- Klein, K. J., & Kozlowski, S. W. J. (2000). Preface. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel Theory, Research, and Methods in Organizations Foundations, Extensions, and New Directions* (pp. xv-xix). San Francisco: Jossey-Bass.
- Madjar, N., Greenberg, E., & Chen, Z. (2011). Factors for radical creativity, incremental creativity, and routine, noncreative performance. *Journal of Applied Psychology, 96*, 730-743.
- McAllister, D. J., Morrison, E. W., Kamdar, D., & Turban, D. B. (2007). Disentangling role perceptions: How perceived role breadth, discretion, instrumentality, and efficacy relate to helping and taking charge. *Journal of Applied Psychology, 92*, 1200-1211.
- Miron, E., Erez, M., & Naveh, E. (2004). Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other? *Journal of Organizational Behavior, 25*, 175-199.
- Morrison, E. W., & Phelps, C. C. (1999). Taking charge at work: Extra-role efforts to initiate workplace change. *Academy of Management Journal, 42*, 403-419.

- Morrison, E., Wheeler-Smith, S., & Kamdar, D. (2011). Speaking up in groups: A cross-level study of group voice climate and voice. *Journal of Applied Psychology, 96*, 183-191.
- Ng, T. W. H., Feldman, D. C., & Lam, S. S. K. (2010). Psychological contract breaches, organizational commitment, and innovation-related behaviors: A latent growth modeling approach. *Journal of Applied Psychology, 95*, 744-751.
- Nijstad, B. A., Berger-Selman, F., & De Dreu, C. K. W. (2014). Innovation in top management teams: Minority dissent, transformational leadership, and radical innovations. *European Journal of Work and Organizational Psychology, 23*, 310-322.
- Nijstad, B. A., Diehl, M., & Stroebe, W. (2003). Cognitive stimulation and interference in idea generating groups. In P. B. Paulus & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (pp. 137-159). New York: Oxford University Press.
- Ohly, S., & Fritz, C. (2010). Work characteristics, challenge appraisal, creativity, and proactive behavior: A multi-level study. *Journal of Organizational Behavior, 31*, 543-565.
- Ohly, S., Sonnentag, S., & Pluntke, F. (2006). Routinization, work characteristics and their relationships with creative and proactive behaviors. *Journal of Organizational Behavior, 27*, 257-279.
- Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal, 39*, 607-634.
- Parker, S. K., & Collins, C. G. (2010). Taking stock: Integrating and differentiating multiple proactive behaviors. *Journal of Management, 36*, 633-662.
- Parker, S. K., Williams, H. M., & Turner, N. (2006). Modeling the antecedents of proactive behavior at work. *Journal of Applied Psychology, 91*, 636-652.
- Potočník, K., & Anderson, N. (2012). Assessing innovation: A 360-degree appraisal study. *International Journal of Selection and Assessment, 20*, 497-509.

- Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Applied Psychology: An International Review*, 53, 518-528.
- Sackett, P. R., & DeVore, C. J. (2001). Counterproductive behaviors at work. In N. R. Anderson, D. S. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of Industrial, Work, and Organizational Psychology* (Vol. 1, pp. 144-164) London, UK: Sage.
- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37, 580-607.
- Sears, G. J., & Baba, V. V. (2011). Towards a multistage and multilevel theory of innovation. *Canadian Journal of Administrative Science*, 28, 357-372.
- Shin, S. J., & Zhou, J. (2003). Transformational leadership, conservation, and creativity: Evidence from Korea. *Academy of Management Journal*, 46, 703-714.
- Sijbom, R. B. L., Janssen, O., & Van Yperen, N. W. (2015). Leaders' receptivity to subordinates' creative input: The role of achievement goals and composition of creative input. *European Journal of Work and Organizational Psychology*, 24, 462-478.
- Suddaby, R. (2010). Editor's comments: Construct clarity in theories of management and organization. *Academy of Management Review*, 35, 346-357.
- Tangirala, S., & Ramanujam, R. (2008). Exploring nonlinearity in employee voice: The effects of personal control and organizational identification. *Academy of Management Journal*, 51, 1189-1203.
- Thomas, J. P., Whitman, D. S., & Viswesvaran, C. (2010). Employee proactivity in organizations: A comparative meta-analysis of emergent proactive constructs. *Journal of Occupational and Organizational Psychology*, 83, 275-300.
- Tims, M., Bakker, A. B., Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior*, 80, 173-186.

- Tornau, K., & Frese, M. (2013). Construct clean-up in proactivity research: A meta-analysis on the nomological net of work-related proactivity concepts and their incremental validities. *Applied Psychology: An International Review*, 62, 44-96.
- Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review*, 26, 289-297.
- Unsworth, K. L. & Parker, S. (2003). Proactivity and Innovation: Promoting a New Workforce for the New Workplace. In D. Holman, T. D. Wall, C. W. Clegg, P. Sparrow & A. Howard (Eds.), *The New Workplace: A Guide to the Human Impact of Modern Working Practices* (pp. 175-196). Chichester: John Wiley & Sons.
- Van Dyne, L., Cummings, L. L., & Parks M. J. (1995). Extra-role behaviors: In pursuit of construct and definitional clarity. In L. L. Cummings & B. M. Shaw (Eds.), *Research in organizational behavior*, vol. 17 (pp. 215-285). Greenwich, CT: JAI Press.
- Van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management Journal*, 41, 108-119.
- Vigoda-Gadot, E. (2007). Redrawing the boundaries of OCB? An empirical examination of compulsory extra-role behavior in the workplace. *Journal of Business & Psychology*, 21, 377-405.
- West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology: An International Review*, 51, 355-387.
- West, M. A., & Anderson, N. R. (1996). Innovation in top management teams. *Journal of Applied Psychology*, 81, 680–693.
- West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3–13). Chichester: Wiley.

- West, M. A., Hirst, G., Richter, A., & Shipton, H. (2004). Twelve steps to heaven: Successfully managing change through developing innovative teams. *European Journal of Work and Organizational Psychology, 13*, 269-299.
- Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review, 26*, 179-201.
- Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal, 53*, 107-128.
- Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: encouraging the expression of voice. *Academy of Management Journal, 44*, 682–696.

Table 1
Conceptual delimitation of constructs

Construct	Definition - Example	Definition Source	Example Studies
Innovation	“The intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society”	West & Farr (1990, p. 9)	Fay, Borill, Amir, Haward, & West (2006); Chi, Huang, & Lin (2009)
Creativity	“The production of novel and useful ideas”	Amabile (1988, p. 126)	Zhang & Bartol (2010); Janssen & Giebels (2013); Sijbom, Janssen, & Van Yperen (2015)
Creativity/Innovation	“Creativity and innovation at work are the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things. The creativity stage of this process refers to idea generation, and innovation to the subsequent stage of implementing ideas toward better procedures, practices, or products. Creativity and innovation can occur at the level of the individual, work team, organization, or at more than one of these levels combined, but will invariably result in identifiable benefits at one or more of these levels-of-analysis”	Anderson, Potočník, & Zhou (2014, p. 1298)	Axtell, Holman, & Wall (2006)

Table 1
Cont.

Construct	Definition - Example	Definition Source	Example Studies
Proactive behaviour	“Taking initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions”	Crant (2000, p. 436)	Parker & Collins (2010); Ohly & Fritz (2010)
Job crafting	“The physical and cognitive changes individuals make in the task or relational boundaries of their work”	Wrzesniewski & Dutton (2001, p. 179)	Tims, Bakker, & Derks, 2012; Berg, Grant, & Johnson (2010a)
Voice	“Making innovative suggestions for change and recommending modifications to standard procedures even when others disagree.”	Van Dyne & LePine (1998), p. 109	Morrison, Wheeler-Smith, & Kamdar (2011); Tangirala & Ramanujam (2008)
Taking charge	“Voluntary and constructive efforts, by individual employees, to effect organizationally functional change with respect to how work is executed within the contexts of their jobs, work units, or organizations.”	Morrison & Phelps (1999), p. 403	Chiaburu & Baker (2006); McAllister, Morrison, Kamdar, & Turban (2007)
Personal initiative	“Personal initiative is a behaviour syndrome resulting in an individual's taking an active and self-starting approach to work and going beyond what is formally required in a given job”	Frese, Kring, Soose & Zempel (1996, p. 38)	Bledow & Frese (2009); Ohly, Sonnentag, & Pluntke (2006)

Table 1
Cont.

Construct	Definition - Example	Definition Source	Example Studies
Submitting suggestions	“An administrative procedure for collection, judging, and compensating ideas which are conceived by employees of the organization”	Ekvall (1971, p. 13)	Frese, Teng, & Wijnen (1999); Ohly et al. (2006)
Extra-role behaviour	“[...] behaviour which benefits the organization and/or is intended to benefit the organization, which is discretionary and which goes beyond existing role expectations.”	Van Dyne, Cummings, & Parks (1995, p. 218)	Chiaburu, Marinova, & Lim (2007); Van Dyne & LePine (1998)

Table 2

Summary of key similarities and differences of the CI-related constructs

Construct	In-role	Extra-role	Compulsory	Discretionary	Required novelty	Target - level of analysis	Key conceptual features
Innovation	Yes	Yes	Yes	Yes	Yes	Organizational, Team, Individual	Idea generation, idea promotion, and idea implementation; social nature – support from wider environment key.
Creativity	Yes	Yes	Yes	Yes	Yes	Team, Individual	Idea generation; mainly intra-individual process that can be enhanced in team settings.
Proactive behaviour	Yes	Yes	No	Yes	No	Individual	Self-initiated, individual behaviour to bring about change related to one's job and beyond.
Job crafting	Yes	No	No	Yes	No	Individual	Proactive behaviour of modifying aspects of one's job.
Voice	Yes	Yes	No	Yes	No	Individual	Proactive behaviour of speaking up about the need for change; related with idea promotion as part of innovation.
Taking charge	Yes	Yes	No	Yes	No	Individual	Proactive behaviour of introducing changes; related with idea implementation as part of innovation.
Personal initiative	Yes	Yes	No	Yes	No	Individual	Persistent and goal-directed proactive behaviour.
Submitting suggestions	Yes	Yes	Yes	Yes	Yes/ No	Individual	A form of personal initiative involving proposing own ideas to others; related with idea generation as part of innovation.
Extra-role behaviours	No	Yes	No	Yes	No	Individual	Discretionary individual behaviours that go beyond the job description for the benefit the organization; different types: only change-oriented extra-role behaviours relevant for the CI-field.

Note. Constructs in bold face have been identified as foundational constructs.

Table 3

Some examples of research questions for future research

Level-of-analysis	Research questions
Individual	What is the construct validity of the CI-related behaviours?
Individual	What are the common personality and other individual differences' antecedents of CI-related behaviours?
Team/ Organizational	What are the mechanisms of translating team creativity into organizational innovation?
Individual/ Team/ Organizational	What are the common positive and negative consequences of CI-related concepts?
Individual/ Team/ Organizational	What is the impact of employee proactive behaviours on team creativity and how does team creativity impact organizational innovation?
Individual/ Team/ Organizational	Is there a stage model of organizational innovation whereby individual level CI-related behaviours lead to team level proactive and creative attempts which in turn result in organizational innovation?
Individual/ Team/ Organizational	What are the facilitating and inhibiting factors in different stages of organizational innovation?

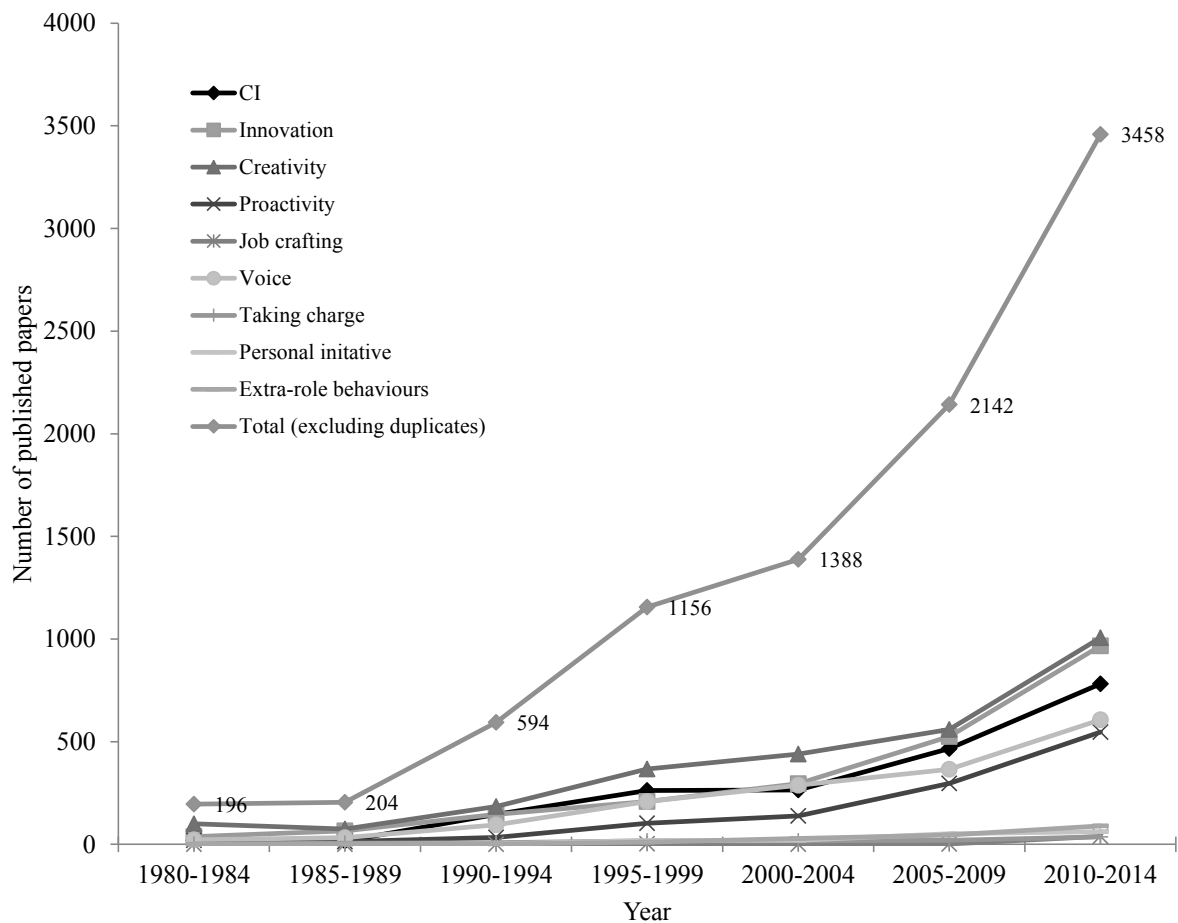


Figure 1. Growth in published papers across the CI literatures. The literature search was conducted in Social Science Citation Index, using change management (a total of 1955 results), innovation (a total of 2242 results), creativity (a total of 2730 results), proactivity/proactive (a total of 1150 results), job crafting (a total of 43 results), voice (a total of 1617 results), taking charge (a total of 106 results), personal initiative (a total of 154 results), and extra-role behaviours (a total of 176 results) as keywords. Only documents from the Psychology and Behavioural Sciences areas within the Management and Psychology (applied and multidisciplinary) subject areas are included. The total number of publications within each year category excludes duplicates across these nine keywords.